

A Study on IOT Approach for Observation Water Quality Sictimization (MQTT algorithm)

A. Abdul Faiz¹, C. Deivasikamani², R. Dharshini², K. Kousalyaa², V. Kavipriya²

¹Assistant professor, Department of CSA, Sri Krishna Arts and Science College, Coimbatore, Tamil Nadu, India

²B.Sc., CSA, Department of CSA, Sri Krishna Arts and Science College, Coimbatore, Tamil Nadu, India

ABSTRACT

Degradation of water resources has become a typical downside. the traditional ways of water quality observation involve the manual assortment of water sample from completely different locations. These water samples were tested within the laboratory mistreatment rigorous skills. Such approaches a time overwhelming and not thought of to be economical. The older technique of water quality detection was time overwhelming, low preciseness and expensive. By that specialize in the on top of problems, an occasional value water quality observation system is developed and designed that may monitor water quality in real time mistreatment IOT. within the planned system water quality parameters are measured by completely different sensors like pH, temperature and dissolved gas for human action knowledge onto a platform via microcontroller system. therefore, so as to satisfy of these needs, alternative technologies may be used like MQTT (Message Queuing measurement Transport) that permits commercial enterprise and subscribing of knowledge between the device and finish device. And with the assistance of MQTT algorithmic rule there'll be concurrent flow of knowledge between the sensors and therefore the servers.

Keywords : Web of Things (IOT), MQTT, Raspberry Pi, Naive Bayes Theorem, Arduino

I. INTRODUCTION

Since the time IOT has evolved loads of issues are solved during this world. By victimization IOT during this water quality watching system varied problems like communication, knowledge assortment, knowledge analysis, early warnings are worked on. however so as to induce this into image, technologies and protocols square measure combined to induce the required output. Here the utilization of MQTT makes the total procedure quick and reliable.

1.1 Purpose

The main purpose of victimisation IOT approach to observe water quality victimisation MQTT

algorithmic program is to develop a system that provides the top user a helpful information used. Conventionally, the water samples square measure collected from completely different places and tested strictly by scientists within the laboratory victimisation several techniques to see the water quality. so older strategies were time overwhelming method however currently the IOT has the potential to modernize the water production, as a lot of and a lot of of its technology is connected to the net. This IOT approach is way higher than standard strategies since it's price friendly, quicker and straightforward to use. [1]

1.2 Background

The parameters for testing the water quality square measure monitored with the assistance of GSM (Global electronic messaging Service) technology however there square measure numerous limitations to the current technology. 1st of all by victimisation GSM over all development price will increase. Not solely this, GSM faces security problems additionally since the user identity confidentiality is profaned by transmission the identities in unprotected kind.

During the transmission of information, it's sent one once the opposite that creates a buzz and delay in transmission. but the info transmission ought to be synchronic, quick and secure. thus rather than victimisation GSM network or the other technology, MQTT algorithmic program are enforced so as to form the system possible, modular, scalar and value economical. Not solely can this, with the assistance of MQTT algorithmic program there'll be synchronic flow of information between the sensors and server. [2]

1.3 technique of investigation

In order to satisfy the wants for developing the system some work has been done before deliver the goods the specified result. The system created earlier use sensors to assemble data concerning the water parameters. at that time the knowledge gathered was sent to raspberry pi, through that it had been exhibited to the pc or any devices. once analysis of the info obtained, the communication half was administrated with the utilization of GSM technology. this technique was useful however had limitations additionally like costly, no real time information may be generated and security problems.

1.4 Scope

To overcome these limitations, changes square measure drained this technique with the assistance of IOT, a replacement water observation system is

developed during which all the water parameters square measure inspected victimisation sensors.

After that the helpful knowledge are going to be sent to the top user via MQTT rule. MQTT makes the communication and transmission of knowledge reliable and fuzz free. except for this it makes the system price friendly because the overall price of the system decreases. the most advantage of exploitation the MQTT is that there'll be synchronic flow of knowledge between the sensors and therefore the server. therefore creating it a perfect selection in terms of property. [3]

II. CHALLENGES

There area unit essentially 3 common challenges this method faces they're security, detector network and therefore the communication.

2.1 Security

Security is a vital issue for any system. Security at each the device and network level is important to the operation of IOT.

- a. Secure booting: once power is initial introduced to the device, the genuineness and integrity of software system on the device is verified exploitation cryptographically generated digital signatures. [4]
- b. Access management: Next the various variety of resource and access control area unit applied. obligatory or roll based mostly access management designed into the software limit the privileges of device elements and applications in order that they access solely the resources they have to try to to their jobs. If any part is compromised, access management ensures that the trespasser contains a least access to alternative elements of the system as attainable.

- c. Device authentication: once the device is blocked into the network, it ought to manifest itself before receiving or transmission knowledge. Deeply embedded device typically don't have users sitting behind keyboards, waiting to input the credentials needed to access the network.
- Available spectrum resources are going to be terribly restricted for brand spanking new IOT wireless network.
- For harsh outside space, low power consumption and easy design are going to be needed. [6]

2.2 Sensor Network

A detector network includes of teams of small, generally battery battery-powered devices and wireless infrastructure that monitor and record conditions in any variety of environments from the manufactory floor to the info center to a hospital workplace and even enter the wild. The detector network connects to the web, associate enterprise WAN or LAN, or a specialised industrial network in order that collected knowledge is transmitted to face systems for analysis and employed in applications.[5]

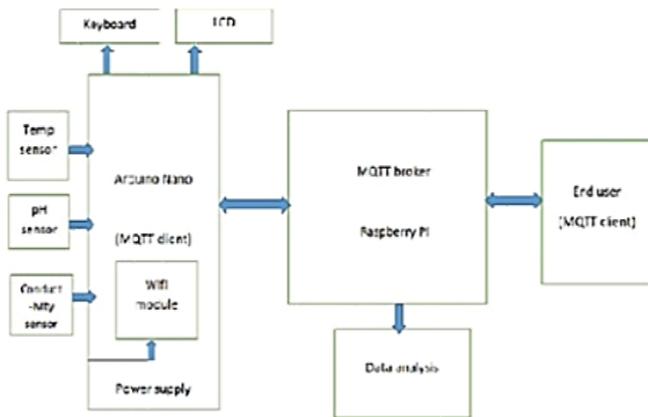
2.3 Communication

Wireless communication system is that the essential a part of the IOT infrastructure, that acts as a bridge for twin directional communication for knowledge assortment and management message delivery. It is applied to numerous IOT applications together with mission important industries, like facility, oil field and cases in our routine life just like the good town we tend to summarize the common challenges and problems on wireless communication for IOT applications.

- Huge volume of sensors with varied sorts and distributed sites ought to be connected, managed and maintained.
- High reliable communication are going to be needed underneath the atmosphere with ton of interfaces.

III. METHODOLGY

- The initial task is to work out that water parameter would offer a detailed indication of pollution. Through in depth analysis the parameter area unit chosen to be composed of pH scale, dissolved element and temperature.
- The second step is choice of locales which will give helpful knowledge. the placement were narrowed right down to industrial areas, sewer waste openings and town lines wherever human interference contains a hefty impact. numerous sensors were put in at such locations for testing.
- The third step is to transmit the info from the detector on to the Arduino kit for more process.
- The transmission of knowledge obtained is completed subsequent step, from wherever MQTT comes within the image. With the assistance of MQTT in conjunction with raspberry pi, the data obtained is passed onto the server and therefore the user.
- Finally knowledge analysis is completed on the nonheritable knowledge set exploitation area Bayes' rule with the assistance of that the specified info is obtained[7]

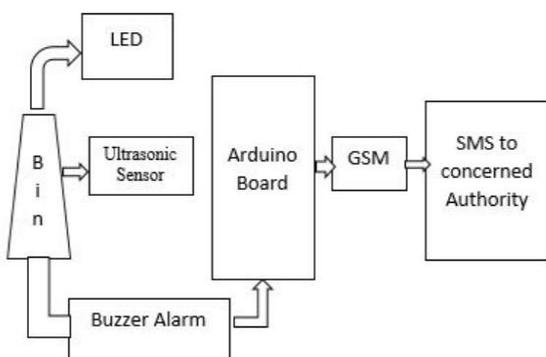


IV. NAIVE BAYES' THEOREM

so as to research the info obtained from the sensors to the MQTT, Naïve Bayes' theorem is employed. Here with the assistance of this classifier, a selected or combined parameter of water quality is checked unrelated to the opposite attributes or it may be aforementioned that each feature being classified is freelance of the worth of the other feature. In easier word the Naïve Bayes' Theorem may be developed as:

$$P(a/b) = P(b/a) P(a)$$

$$P(b)$$



Flow Chart

The flow chart of the project is shown in fig. It primarily provides the thought of this project. The flow of the project of sensible Waste Management System begins with choice begin. supersonic sensors

area unit deployed that senses the amount of trash within the bins and once it crosses the edge level, message is send to the involved authority via GSM in order that the involved authority will clean the waste bin as before long as potential. the method gets repeat itself once more and once more till the waste bin isn't clean.

Ultrasonic Sensor

The device is employed to observe the amount of the dirt within the ash-bin. It uses a sound transmitter and receiver .An unhearable device produce a unhearable pulse. called ping and listen for the reflection of pulse. The sound pulse is formed electronically employing a asdic projector consisting of signal generator, power electronic equipment, and transducer array .A beam former is sometimes used to concentrate the intensity level into the beam. [8]



Ultrasonic device module consists of four pins:

- VCC - 5V of power provide
- TRIG - Trigger Pin
- ECHO - Echo Pin
- GND - To ground

V. CONCLUSION

During the transmission of information, it's sent one when another that creates a buzz and delay in

transmission. but the info transmission ought to be synchronal, quicker and secure.

So as to full fill of these necessities, different technologies may be used like MQTT (Message Queuing measure Transport). rather than victimisation GSM network or the other technology, MQTT formula are going to be enforced to create the system possible, modular, scalar and value economical in conjunction with this it makes communication of information between sensors and servers at the same time flow. an oversized quantity of information may be sent while not facing any hurdle.

In future the system may be enforced on the larger scale with the assistance of accessibility of assorted resources. different water quality deciding sensors may be used for analysis of additional precise and correct information.

VI. REFERENCES

- [1]. Pavana NR and Dr. M.C. Padma, "Design of Low Cost System for Real Time Monitoring of Water Quality Parameters in IOT Environment", International Journal of Advanced Research in Computer Science and Application Volume 4, Issue 5, May 2016.
- [2]. A.N. Prasad, K.A. Mamun, F.R. Islam, H. Haqva," Smart Water Quality Monitoring System", IEEE, 2015.
- [3]. N Vijayakumar, R Ramya,"The Real Time Monitoring of Water Quality in IOT Environment", International Conference on Circuit, Power and Computing Technologies, IEEE, 2015.
- [4]. Young Hua Ling, Jiabin Tang, Qing Yang, Chao Zui , "Wireless Communication for IOT(Internet of Things)", IBM Research. Accessed December 17, 2016.
- [5]. Wind River," SECURITY IN THE INTERNET OF THINGS –Lessons from the past for the Connected future "2015. Accessed Dec 17, 2016.
- [6]. Design Spark,' 11 Internet of Things (IOT) Protocols you need to know about ". Accessed December 10, 2016.
- [7]. OASIS –MQTT Version 3.1.1 plus Errata 01.Accessed November 7, 2016.
- [8]. Kumar, N. Sathish, et al. "IOT based smart garbage alert system using Arduino UNO." [7] Karadimas, Dimitris, et al. "An integrated node for SmartCity applications based on active RFID tags; Use case on waste-bins." Region 10 Conference (TENCON), 2016 IEEE. IEEE, 2016.
- [9]. Medvedev, Alexey, et al. "Waste management as an IoTenabled service in smart cities".Conference on Smart Spaces. Springer International Publishing, 2015.

Cite this article as :

A. Abdul Faiz, C. Deivasikamani, R. Dharshini, K. Kousalyaa, V. Kavipriya, "A Study on IOT Approach for Observation Water Quality Sictimization (MQTT algorithm)", International Journal of Scientific Research in Computer Science, Engineering and Information Technology (IJSRCSEIT), ISSN : 2456-3307, Volume 5 Issue 2, pp. 29-33, March-April 2019. Available at doi : <https://doi.org/10.32628/CSEIT195162>
Journal URL : <http://ijsrcseit.com/CSEIT195162>